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Polymeric laser-active media: The possibility of lasing and exploitable properties advance

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Abstract

Laser-spectroscopic studies of polymeric laser-active media based on Rhodamaine 6G dye incorporated into modified Methylmethacrylate with Methacrylic Acid copolymer samples had been carried out. Absorption and luminescence spectra together with luminescence quantum yield were studied. The basic parameters of the laser oscillation and their stability were obtained. The new potential photostabilizator azotes- and sulphurs-containing organic compounds - Thiourea and Thiazol aromatic derivatives was specially synthesized and their role to dye and polymeric host photochemical stability were studied. In this paper it was shown that these synthesized compounds indeed are high effective photostabilizators. Also it was demonstrated that using of these additives leads to significant increasing of laser action efficiency, from one hand and to rising the working characteristics (operational lifetime) of solid-state laser-active media based on the new synthesized polymer composition materials, from other hand.

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Keywords

Active media, Dye-doped polymers, Operational lifetime, Optical spectra, Photochemical stability